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GROWTH OF CROP AND LIVESTOCK OUTPUT IN SELECTED DEVELOPING NATIONS

1948 TO 1965

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PREFACE

This report augments Foreign Agricultural Economic Report No. 27, Changes in Agriculture in 26 Developing Nations, 1948 to 1963, published in November 1965. It is another in a series of reports on agricultural output prepared by the Economic Research Service for the Agency for International Development under a project agreement entitled "Factors Associated with Differences and Changes in Agricultural Production in Underdeveloped Countries." Data are evaluated on total agricultural output, including livestock production, for 12 countries for which data on crop output only were presented in the earlier publication. Information is also given on crop output in 17 countries not previously studied.

ACKNOWLEDGMENTS

Data on crop and livestock output and on associated crop area and livestock numbers were developed under the guidance of Charles A. Gibbons, Foreign Regional Analysis Division. David Mateyka assisted in supervising initial computation work. The overall study was carried out under the direction of Wade F. Gregory, Chief, Economic Development Branch; Raymond P. Christensen, Director, Foreign Development and Trade Division; and Kenneth L. Bachman, former Director, Foreign Development and Trade Division.

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HIGHLIGHTS

Total crop output in the 17 developing nations under review increased 30 to 300 percent during 1948-65, previously unavailable data show. When measured on a per capita basis, however, total crop output increased less than 2 percent a year in nine countries and declined in three. Data on livestock and total agricultural output for 12 other developing nations during the same period revealed a similar pattern of overall growth moderated by population increases.

Of the 17 countries, Nicaragua tripled crop output, and Ecuador, Guatemala, Guyana, Jamaica, and Syria doubled crop output. Paraguay, Morocco, and Senegal increased crop output by at least 67 percent, while Bolivia, the Dominican Republic, Honduras, Peru, Malagasy Republic, Mauritius, and Ceylon increased crop output by at least 50 percent. Because populations were also growing, increases in per capita crop output were less, but in five countries, growth of per capita output measured 2 percent or more per year; in four countries, output increased 1 to 1.9 percent per year. Only three of the 17 countries--the Dominican Republic, Uruguay and Mauritius--had a decline in per capita crop output over the period 1948-65.

Adequate data on crop acreages were available in 12 of the 17 study countries. In seven of these countries, the principal source of increased output was increased land area; higher yields were the major source of increase in the other five countries. In those countries where greater land area was the main source of increased output, it was impossible to determine how much of the change in land area resulted from multiple cropping as opposed to bringing additional land under cultivation.

Although there was no apparent overall tendency toward more or less crop specialization, some changes can be observed. Nicaragua had noticable shifts in several crops. Cotton, which represented only 6 percent of the total value of crop output in 1948-50, increased to nearly 50 percent in 1963-65. At the same time, coffee declined in importance from 41 to 20 percent. The relative importance of grains also decreased. In Guatemala, there was less reliance upon wheat and coffee, which made up almost 70 percent of the total value in the beginning period; these crops dropped to 58 percent in 1963-65. At the same time, cotton grew in importance from 0.6 percent to more than 20 percent. A similar situation was observed in Syria, where cotton grew from 6.3 to 27.3 percent, with most of the increase at the expense of grains.

Changes for individual crops were mixed. Maize declined in relative importance in 11 of the 17 countries. Rice, on the other hand, increased in 10 countries and decreased in six. Sugar became more important in eight of the 12 countries; oilseed output grew in 10 of the 12 producing countries.

In the 12 developing nations for which livestock and total agricultural output data are presented, livestock output rose 4.9 percent in seven countries from 1948 to 1965. In the 1948-56 period, in the six countries for which growth rates were statistically significant, livestock output increased at a rate of 4.9 percent or more per year. In the 1956-65 period, only Greece, Japan, and Spain maintained this level of growth. Four countries (Brazil, Israel, Poland, and Taiwan) increased livestock output at least 2.4 percent per year in the latter period. On a per capita basis, the increases were less notable. In only six countries per capita livestock output increased 3 percent or more a year from 1948 to 1965. Per capita growth did not prevail through the entire period; from 1956 to 1965, livestock output per capita declined in seven countries.

Growth of total agricultural output exceeded 4 percent per year in Brazil, Greece, Israel, and Taiwan, and increased from 2 to 3.9 percent in seven other countries. When total output is measured on a per capita basis, a portion of the total increase is absorbed by population growth. Consequently, in countries where population has risen sharply, the increases are much less impressive.

GROWTH OF CROP AND LIVESTOCK OUTPUT IN SELECTED DEVELOPING NATIONS 1948 to 1965

By

John R. Schaub and Stanley F. Krause[1/]

INTRODUCTION

The overall development of a nation's agriculture is contingent not only on increasing crop and livestock output but on increasing per capita output as well. This report measures crop output for 17 developing countries: Bolivia, Dominican Republic, Ecuador, Guatemala, Guyana, Honduras, Jamaica, Nicaragua, Paraguay, Peru, and Uruguay in Latin America; Malagasy Republic, Mauritius, Morocco, and Senegal in Africa; Syria in the Near East; and Ceylon in the Far East. Data are also presented on livestock output and total agricultural output for 12 countries analyzed in a 1965 study by the U.S. Department of Agriculture. 2/ The 12 study countries are Argentina, Brazil, Chile, and Colombia in Latin America; Greece and Turkey in the Near East; Spain and Poland in Europe; the United Arab Republic (Egypt) in North Africa; Japan and Taiwan in the Far East.

The objectives of this report are (1) to present a compilation of basic index numbers of agricultural output; (2) to measure levels, changes, sources of change, and compositional changes in crop output; and (3) to provide basic data relating to changes in livestock production in selected countries. The results should prove helpful in future research involving agricultural output, both in the formulation and the testing of hypotheses.

CROP OUTPUT IN 17 NATIONS

Rates of Growth

Crop production in selected underdeveloped countries was summarized for the period 1948 to 1965 in value aggregates based on 1957-59 prices for

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1/ John R. Schaub is an agricultural economist with the Foreign Development and Trade Division, Economic Research Service; Stanley F. Krause, agricultural economist formerly with the Foreign Development and Trade Division, is with the Farmer Cooperative Service, U.S. Department of Agriculture.

2/ Foreign Development and Trade Division, Economic Research Service. Changes in Agriculture in 26 Developing Nations, 1948 to 1963. U.S. Dept. Agr., Foreign Agr. Econ. Rpt. No. 27, Nov. 1965.

individual crops. 3/ These value aggregates were converted into index numbers and are shown in appendix table 1. Growth rates in crop output for the study period were 4.0 percent or more per year in eight countries. Output doubled in six of the eight countries--Ecuador, Guatemala, Guyana, Jamaica, Nicaragua, and Syria. The other two countries with growth rates of more than 4.0 percent were Bolivia and Senegal. Crop output grew from 2.0 to 3.9 percent a year in seven countries, and from 0.0 to 1.9 percent in Uruguay and Mauritius. However, annual changes in crop output in Uruguay and Mauritius were highly variable with no well-defined trend, indicating that the statistical significance of growth rates for these countries is questionable.

Agricultural production varied considerably from year to year in some countries. For example, in Syria the index of crop output fell from 109 in 1954 to 82 in 1955, and then increased to 115 in 1956. In Mauritius, the index fell from 104 in 1959 to 44 in 1960 (principally as a result of a hurricane), and rose to 100 in 1961. Crop output was generally more stable in other countries.

A comparison of growth rates for the beginning and ending subperiods (1948-56 and 1956-65) shows that the rate of increase in crop output decreased in 10 countries and increased in six countries (table 1). 4/ However, four of the countries that had lower crop output growth rates in the ending than in the beginning period still had growth rates above 4.0 percent in the later period. Also, the three countries that had compound growth rates of less than 2.5 percent in the 1948-56 period had rates above 4.0 percent in the 1956-65 period.

The 1965 study of the U.S. Department of Agriculture suggests probable reasons why high growth rates were not maintained throughout the entire study period:

> The earlier rapid rates of increase may reflect a "catching up" in the exploitation of simple, easily made improvements in agricultural production. Consistent with this possibility, some of the countries with much higher rates of increase in output in the latter period may perhaps have gotten a later start in their programs to increase agricultural productivity. Like those starting earlier, these too may soon exhaust their simple, easily exploited opportunities for increasing output.
>
> This hypothesis suggests that once countries "catch up" on simple easily made improvement opportunities, their further progress depends upon major structural changes, such as development of improved technologies and improvements in credit, marketing, educational and research facilities. In addition to organizing and promotional abilities, these kinds of improvements require new capital investments and considerable time for full fruition. There is no inherent reason, of course, why less-developed countries

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3/ Crop output includes food crops, beverage crops, fibers, tobacco, and industrial crops. In a few cases, data are for field crops only, since information on tree crops is not available.

4/ Growth rates for six of the 10 countries are not significant at the 5 percent level.

Table 1.--Annual compound rates of change in total and per capita crop output, 17 countries, 1948-65, 1948-56. and 1956-65 1/

Country and region	1948-65			1948-56		1956-65	
	Annual compound change in total crop output 2/	Population growth rate 2/	Annual compound change in crop output per capita 2/	Annual compound change in crop output 2/		Annual compound change in crop output 2/	
				Total	Per capita	Total	Per capita
	Percent						
Latin America							
Bolivia	4.0	1.4	2.6	3/	3/	2.9	1.4
Dominican Republic	2.9	3.5	-0.6	3.8	4/0.4	4/1.3	-2.3
Ecuador	6.6	3.2	3.4	15.3	11.9	2.8	4/-0.4
Guatemala	5.6	3.1	2.1	2.4	-0.7	7.5	4.2
Guyana	4.8	2.9	1.9	5.5	2.6	4.2	1.3
Honduras	3.2	2.8	4/0.4	1.7	-0.6	4.3	4/1.1
Jamaica	4.9	1.5	3.4	5.7	3.7	5.0	3.6
Nicaragua	8.0	2.9	4.9	14.3	11.0	8.5	5.4
Paraguay	3.6	2.4	1.2	3.7	4/1.3	3.8	1.3
Peru	3.3	2.0	1.3	3.6	4/1.5	3.9	2.7
Uruguay	4/0.7	1.1	4/-0.4	6.0	4/4.1	4/0.2	4/0.2
Africa							
Malagasy Republic	3.2	2.6	4/0.6	4.7	2.6	4/2.7	4/-0.5
Mauritius	4/1.7	3.0	4/-1.3	4.3	4/-0.9	4/1.9	4/-1.9
Morocco	2.9	2.7	0.2	5.4	4/-0.7	4/4.2	1.4
Senegal	4.2	2.6	1.6	4/1.6	4/-3.6	4.2	1.9
Near East and S. Asia							
Syria	4.5	3.8	0.7	5.0	1.5	6.5	2.0
Far East							
Ceylon	3.2	2.6	0.6	3.9	1.3	3.5	0.9

1/ Actual years of data used indicated in appendix table 1.

2/ Compound growth rates computed by least squares using the equation: $\log y = a + bt$, where y = crop output or population and t = time. The antilog of the regression coefficient - 1 is the estimated growth rate computed from production indexes in appendix table 1 and from population data found in the Demographi Yearbooks, United Nations and International Monetary Statistics, International Monetary Fund.

3/ Data not available.

4/ Computed growth rate statistically significant at greater than 5 percent level. All other growth rates are significant at the 5 percent level or less.

cannot begin building the foundation for sustained progress, even while using benefits of the simpler improvement opportunities that they now have. 5/

Population has grown rapidly in most of the 17 study countries. The median population growth rate is about 2.65 percent. Growth in per capita crop output, of course, was much lower than growth in total crop output, but per capita output increased in all but three countries.

Per capita growth rates in crop output indicate the progress of these countries in producing an adequate supply of food and other crop products in relation to population growth. Annual growth rates in crop production per capita were 2.0 percent a year or more in six countries before 1956, and in five countries after 1956. Per capita growth rates were from 1.0 to 1.9 percent a year in four countries before 1956, and in six countries after 1956 (table 2).

Table 2.--Selected countries and 1965 populations distributed by annual compound rate of growth in crop output per capita, 1948-56, 1956-65 1/2/

Annual compound rate of growth in crop output per capita	Countries	1965 Population	
		Number	Percentage distribution
	Number	Million	Percent
1948-56			
2.0 percent and over	6	18.3	24.1
1.0 to 1.9 percent	4	30.2	39.7
0.0 to 0.9 percent	1	3.6	4.7
Decrease	5	24.0	31.5
Total	3/16	76.1	100.0
1956-65			
2.0 percent and over	5	24.8	31.0
1.0 to 1.9 percent	6	25.3	31.7
0.0 to 0.9 percent	2	13.9	17.4
Decrease	4	15.9	19.9
Total	17	79.9	100.0

1/ Crop growth rates from table 1; population data from sources cited in table 1.
2/ Actual years of data used indicated in appendix table 1.
3/ Data not available for Bolivia.

5/ Foreign Agr. Econ. Rpt. No. 27, p. 7. (See footnote 2, p. 1, for complete citation.)

Table 2 also shows that about 63 percent of the aggregate population of the 17 study countries lived in countries where annual crop output growth rates were 1 percent or higher in both the beginning and ending periods. For the beginning period (1948-56), per capita crop output decreased in five countries, accounting for over 30 percent of the population of the 17 study countries. For the later period (1956-65), only four countries, or 20 percent of the aggregate population of the study countries, had a negative growth rate in per capita crop output. This comparison of crop output growth rates for the two periods indicates a slight tendency toward moderate growth in per capita crop output for the 17 countries. Less variability in growth rates among countries in the later than in the earlier period was also observed.

Sources of Change in Crop Output

Annual data on the land devoted to individual crops and the yield of these crops can be used to determine the relative importance of three sources of change in crop output: (1) changes in total area of crops harvested, (2) changes in crop yields, and (3) changes in "crop pattern" from low- to high-value crops per unit of land area, or vice versa.

Table 3 shows sources of change in output of field crops for 12 of the 17 study countries for which adequate data on crop acreages were available. In seven of these 12 countries, the principal source of increased output was increased crop area. In the remaining five, the principal source was larger yields. A shift from lower to higher value crops per unit of land area was the source of 20 percent or more of the increased output in four countries. These shifts generally involved major increases in labor-intensive crops, such as vegetables, cotton, and sugarcane.

Conditions in each country generally determine the primary means of achieving increased output--more crop area or larger crop yields. Of the four African countries, only Morocco gained most of its increase through higher yields. These increased yields resulted generally from more widespread use of irrigation. In 1964, 1 million acres of land were under irrigation in Morocco, in comparison with an estimated 384,000 acres in 1954. 6/

For the six Latin American study countries, yield was the principal source of growth in Guatemala, Nicaragua, and Uruguay; increased area was the major source in Ecuador, Honduras, and Peru.

The expansion of crop area in many countries may be attributed to increased multiple cropping. Multiple cropping involves the growth of more than one crop a year on the same plot of land. This practice tends to increase output per unit of land. However, few countries compile statistics needed to measure the effect of multiple cropping on crop output. Consequently, it was not possible to account adequately for the effects of multiple cropping.

6/ Santmyer, Carolee. Morocco's Agricultural Economy in Brief. U.S. Dept. Agr., ERS-Foreign 214, March 1968. Also, unpublished data of the Foreign Regional Analysis Division, Economic Research Service, U.S. Department of Agriculture.

Table 3.--Sources of change in field crop output for 12 study countries 1/

Country and region	Period	Annual compound change in field crop output	Source of change 2/: Area of crops	Crop pattern	Crop yield
	Years	Percent			
Latin America					
Ecuador	1950-65	4.6	57.2	12.9	29.9
Guatemala	1949-65	7.2	23.4	23.6	53.0
Honduras	1948-65	3.2	130.7	-18.6	-12.1
Nicaragua	1948-65	9.6	28.2	15.2	56.6
Peru	1948-65	2.6	68.1	17.3	14.6
Uruguay	1948-65	0.7	-21.2	41.4	79.8
Africa					
Malagasy Republic	1948-65	3.2	65.1	18.0	16.9
Mauritius	1948-65	1.8	48.8	17.4	33.8
Morocco	1948-65	2.0	19.1	27.0	53.9
Senegal	1948-65	4.1	51.6	11.8	36.6
Near East and South Asia					
Syria	1948-65	4.6	58.1	21.5	20.4
Far East					
Ceylon	1948-65	3.2	26.7	-3.2	76.5

1/ Adequate crop acreage data not available for five countries

2/ The total change in crop output is defined as $\sum_i^k V_{in} - \sum_i^k V_{io}$. The absolute change in crop output, resulting only from a change in area of crops, is calculated as $\left(\frac{\sum_i^k I_{in}}{\sum_i^k I_{io}} - 1\right) \sum_i^k V_{io}$, and the absolute change in crop output resulting from a change in crop patterns (a shift in the composition of crops produced to higher or lower unit values) is calculated as:

$$\sum_i^k \left(\frac{I_{in}}{I_{io}}\right) V_{io} - \left(\frac{\sum_i^k I_{in}}{\sum_i^k I_{io}}\right)\left(\sum_i^k V_{io}\right).$$

The effect attributed to yield is a residual resulting from subtracting the sum of the area and crop effect from the total change. The yield effect includes interaction. The changes are expressed as a percent of total change. The notation used above is defined as:

I_i = land area in crop i; V_i = aggregate value of crop i in constant prices.
o = base period; n = ending period; k = number of crops.

There is still sufficient undeveloped land in many countries to permit a substantial increase in crop output through expansion of cultivated land area. This is particularly true of Central and South Africa and Latin America. However, use of undeveloped land does not automatically offer an easy means of increasing output, since there may be important economic, technological, health, and social barriers to bringing new land into cultivation. These barriers, in the absence of strong incentives, may discourage settlement of undeveloped areas.

Opportunities to increase output by enlarging cropland area will gradually be reduced as populations increase and additional land is brought under cultivation. At the present time, both increased area and increased yield remain as potential sources of increased output in many countries. As the amount of undeveloped land diminishes, it is expected that it will become increasingly necessary to achieve greater food production through yield increases. It is interesting to note that yields for the 1948-65 period increased in all countries except Honduras. Furthermore, in Guatemala and Nicaragua, where the crop output was 4.0 percent a year or more, yield was the principal source of growth.

Changes in Crop Area and Yield

Table 4 complements table 3 by providing compound annual growth rates on area of cropland, crop output per unit of land, and crop yield. The measurement of changes in "crop output per unit of crop area" includes the combined effects of three factors: multiple cropping, yield changes, and shifts to crops of different values per unit. The item "crop yields" refers only to the percentage change in yield for each of the field crops grown.

Honduras, Nicaragua, and Syria achieved increases in harvested area of 3 percent or more per year. Five other countries increased cropland area by 2.0 to 2.9 percent a year. They were Ecuador, Guatemala, Peru, Malagasy Republic, and Senegal. An increase of 2 to 3 percent a year in harvested crop area is substantial. Data were not available to indicate how much of the increase in harvested crop area resulted from land area expansion or from multiple cropping. Only Uruguay showed a slight reduction in area of crops harvested.

Some countries increased their output rapidly by increasing area under cultivation without any substantial change in yields (table 4). In the eight countries where the area of crops harvested increased at least 2 percent a year, only two countries--Guatemala and Nicaragua--had yield increases of 3.0 percent or more. Both countries also experienced rapid increases in the rate of expansion in land area. Yield increases in the other six countries were 1.2 percent or less.

Major improvements in production practices are required to achieve high rates of increase in output per hectare. These changes were effected in Guatemala and Nicaragua where crop output per unit of land area increased over

Table 4.--Annual compound rate of change in field crop output, area of field crops, field crop output per unit of crop area, and field crop yields, selected countries and years

Country and region	Period	Annual compound rate of change			
		Field crop output	Area of field crops	Field crop output per unit of crop area 1/	Field crop yields
	Years	Percent			
Latin America					
Ecuador	1950-65	4.7	2.9	1.7	1.1
Guatemala	1949-65	7.2	2.7	4.5	3.1
Honduras	1948-65	3.2	3.9	-0.6	-0.3
Nicaragua	1948-65	9.6	4.6	4.7	5.0
Peru	1948-65	2.7	1.6	1.0	0.4
Uruguay	1948-65	2/0.7	-0.9	1.6	1.7
Africa					
Malagasy Republic	1948-65	3.2	2.4	0.8	0.5
Mauritius	1948-65	2/1.7	2.0	2/-0.2	0.8
Morocco	1948-65	2.1	0.3	1.7	1.7
Senegal	1948-65	4.1	2.3	1.9	1.[illegible]
Near East and South Asia					
Syria	1948-65	4.6	2.5	2/1.3	0.9
Far East					
Ceylon	1948-65	3.2	1.0	2.1	2.3

1/ Includes combined effect of changes in crops and yields.
2/ Computed growth rates statistically significant at less than the 5 percent level. All other growth rates significant at the 5 percent level or less.

4 percent a year. Larger yields from cotton contributed to the high growth rates. 7/

Crop output per unit of land area increased from 2.0 to 2.9 percent a year in three countries: Uruguay, Morocco, and Ceylon. In Honduras, crop output per unit of land declined slightly; however, the area in crops increased 4.2 percent a year.

Annual changes in output per hectare of land harvested also are shown by index numbers in appendix table 2. Year-to-year variations of crop output per hectare are similar to the pattern of variations in total output shown in appendix table 1.

7/ In Guatemala, average yield of cotton lint was 360 kilograms per hectare in 1949-51, and 710 kilograms per hectare in 1963-65. In Nicaragua, the average cotton lint yield was 330 kg./ha. in 1948-50, increasing to an average 800 kg./ha. in 1963-65. (Based on unpublished data from Foreign Regional Analysis Division, Economic Research Service, U.S. Department of Agriculture.)

Changes in Crop Patterns

Table 5 shows the importance of individual crops in the growth of total crop output in each country. For example, if total crop output in a specific country increased $10 million from the beginning to the end of the period (constant price basis), and rice represented $2 million of the increase, rice would be shown as accounting for 20 percent of the total increase; likewise, a negative percentage indicates that a particular crop had an adverse effect on the growth of crop output.

In nine countries, one crop accounted for half or more of the total increase in crop output; elsewhere, the increase was more widely distributed among several crops. Ecuador and Nicaragua had growth rates of 6.6 and 8.0, respectively, with one crop or category accounting for more than half the total growth. In Ecuador the dominant crop was bananas, classified in the table under vegetables and fruits. Cotton was the dominant crop in Nicaragua. Guyana, Jamaica, and Senegal were among the study countries with growth output rates of 4.0 to 4.9 percent in which one crop or group of crops contributed more than half the total increase in output. In Guyana, the principal growth crop was rice; in Jamaica, sugarcane and in Senegal, peanuts (classified as oilseeds in table 5). It should be noted that simply because the aggregate value of one crop decreases in relative importance while another rises does not necessarily imply that there has been a shift in resource allocation among crops. The differences in the relative importance of crops could be a result of varying rates of price and yield changes among crops. For example, in Bolivia, the decreased importance of potatoes and the increased importance of sugar probably are unrelated to each other.

Data on the composition of crop output in the 17 study countries are presented in table 6. A comparison of these figures permits a determination of a country's level of specialization in crop production and whether there has been a trend toward specialization or diversification in crop output mix. Table 7, which is derived from table 6, gives the absolute percentage point changes in composition of crops between the beginning and ending study periods.

Countries with changes of less than 5 percentage points.--An analysis of tables 6 and 7 shows that in six countries (Dominican Republic, Jamaica, Malagasy, Mauritius, Senegal, and Ceylon), no crop or crop group had an increase or decrease of more than 5 percentage points in its share of crop output. This indicates the level of specialization (or diversification) was approximately unchanged between the beginning and ending study periods. However, in all six countries, the level of crop specialization is high (table 6). Mauritius is the most striking example of specialization. Approximately 95 percent of that country's output is sugar. In Senegal, 64 percent or more of total crop output is peanuts; in Jamaica, 57 percent is sugar; in Malagasy, 54 percent is rice; in Ceylon, a combination of tea, copra, and rice account for 60 percent or more of total crop output; and in the Dominican Republic, the output of three crops, (coffee, cocoa, and sugar) makes up more than 40 percent of total crop output.

Table 5.--Distribution of the change in value of crop output by kind of crop, 17 countries, 1948-65 1/

Country and region	Annual compound rate of change in crop output	Maize	Wheat	Rice	Other grains	Pulses	Potatoes and yams	Other root crops	Sugarcane	Annual oilseed crops	Vegetables and fruits	Olives, palms, coconuts, and copra	Coffee, tea, and cocoa	Tobacco	Cotton	Other crops
	Percent															
Latin America																
Bolivia	4.0	36.0	1.8	6.0	7.0	1.5	23.9	2.3	19.3	---	---	---	2.2	---	---	---
Dominican Republic	2.9	3.8	---	22.3	---	-2.8	-0.4	3.4	31.0	11.4	0.9	---	28.9	1.5	---	---
Ecuador	6.6	3.7	1.9	6.2	-0.4	0.4	6.1	---	6.3	1.1	53.2	---	21.1	---	0.4	---
Guatemala	5.2	14.2	1.8	0.6	0.6	1.8	0.4	---	11.0	6.2	-1.4	---	27.6	---	37.2	---
Guyana	4.8	---	---	55.7	---	---	---	---	38.5	---	3.6	-0.2	2.4	---	---	---
Honduras	3.2	24.2	---	1.7	2.2	7.7	---	1.6	6.4	2.9	15.6	---	27.8	-1.5	11.4	---
Jamaica	4.9	-2.5	---	0.5	---	2.3	27.8	-2.0	64.1	---	5.0	---	0.2	4.6	---	---
Nicaragua	8.0	6.0	---	1.2	0.7	2.7	---	---	3.0	13.9	---	---	11.9	2.3	58.3	---
Paraguay	3.6	9.2	1.8	4.1	---	5.0	1.9	31.1	8.9	18.7	---	---	9.3	7.9	1.9	---
Peru	3.3	10.4	0.5	7.7	-1.0	1.3	11.0	6.5	26.8	4.4	---	---	---	0.2	32.2	---
Uruguay	0.7	6.6	1.9	12.4	11.2	---	50.1	---	32.8	-15.0	---	---	---	---	---	---
Africa																
Malagasy Republic	3.2	1.8	---	58.9	---	1.9	---	5.6	---	2.9	---	---	22.1	1.2	---	5.6
Mauritius	1.8	---	---	---	---	---	---	---	92.5	---	---	---	7.0	---	---	0.5
Morocco	2.9	-0.4	34.3	3.0	-0.5	10.5	10.8	---	---	-2.9	42.7	---	---	---	2.5	---
Senegal	4.2	1.2	---	7.5	20.5	-1.4	0.2	---	---	72.0	---	---	---	---	---	---
Near East, S. Asia																
Syria	4.5	-1.5	7.5	-1.9	10.2	1.7	1.0	---	3.1	19.2	10.3	1.8	---	2.2	46.4	---
Far East																
Ceylon	3.2	0.1	---	29.8	0.3	---	1.3	2.2	---	0.4	---	19.2	37.0	0.5	---	9.2

1/ Actual years of data used indicated in appendix table 1.

Table 6.--Percentage composition, by crops, of aggregate value of crop output, 17 countries and selected years

Country	Period	Maize	Wheat	Rice	Other grains	Pulses	Potatoes and yams	Other root crops	Sugarcane and beets	Annual oil-seed crops	Vegetables and fruits	Olives, palms, coconuts, and copra	Coffee, tea, and cocoa	Tobacco	Cotton	Other crops 1/
		Percent														
Bolivia	1954-56	33.0	5.7	4.0	4.0	2.5	44.4	4.7	0.7	---	---	---	1.0	---	---	---
	1963-65	33.9	4.5	4.7	5.0	2.2	37.8	3.9	6.6	---	---	---	1.	---	---	---
Dominican Republic	1948-50	8.1	---	7.6	---	5.9	5.1	8.4	19.7	2.8	11.0	---	23.8	7.6	---	---
	1963-65	6.7	---	12.3	---	3.1	3.3	6.8	23.4	5.6	7.7	---	25.4	5.7	---	---
Ecuador	1950-52	9.5	3.2	9.7	5.2	2.6	7.8	---	4.4	0.7	30.7	---	25.4	---	0.8	---
	1963-65	6.1	2.4	7.7	2.0	1.4	6.9	---	5.5	0.9	43.6	---	23.0	---	0.5	---
Guatemala	1948-50	33.8	1.7	0.9	0.6	3.0	0.5	---	5.8	0.1	9.4	---	42.6	1.0	0.6	---
	1963-65	24.0	1.8	0.7	0.6	2.5	0.5	---	8.8	3.4	2.7	---	34.1	0.6	20.3	---
Guyana	1948-50	---	---	30.3	---	---	---	---	61.6	---	.5	6.0	1.6	---	---	---
	1963-65	---	---	43.0	---	---	---	---	50.0	---	2.1	2.9	2.0	---	---	---
Honduras	1948-50	23.5	---	2.6	7.5	4.1	---	1.9	9.5	---	30.5	---	16.0	4.1	0.3	---
	1963-65	23.7	---	2.2	5.5	5.5	---	1.8	8.3	---	24.8	---	20.5	2.0	5.7	---
Jamaica	1948-50	3.2	---	1.4	---	1.6	18.6	6.1	57.3	---	3.3	---	6.8	1.7	---	---
	1963-65	0.4	---	1.0	---	2.0	23.1	2.1	60.7	---	4.2	---	3.4	3.1	---	---
Nicaragua	1948-50	22.4	---	4.8	6.4	6.1	---	---	7.2	5.9	---	---	40.5	0.6	6.1	---
	1963-65	10.4	---	2.1	2.2	3.6	---	---	4.1	8.4	---	---	19.5	1.8	47.9	---
Paraguay	1948-50	16.7	.2	2.8	---	2.5	4.1	53.9	3.4	5.4	---	---	.1	3.7	7.2	---
	1963-65	13.5	.9	3.4	---	3.6	3.2	44.2	5.7	11.2	---	---	4.1	5.4	4.8	---
Peru	1948-50	5.7	3.6	5.4	4.5	1.4	26.9	5.5	16.6	3.1	---	---	2.1	0.3	24.9	---
	1963-65	5.1	2.6	7.3	2.8	1.4	16.4	4.3	19.3	3.6	---	---	9.3	0.2	27.7	---
Uruguay	1948-50	13.8	35.9	5.4	6.4	---	9.5	---	0.9	28.1	---	---	---	---	---	---
	1963-65	12.0	27.4	7.2	7.6	---	19.5	---	8.9	17.4	---	---	---	---	---	---
Malagasy	1948-50	3.4	---	53.7	---	---	---	13.2	---	.5	.9	---	22.4	1.8	---	4.1
	1963-65	2.8	---	55.3	---	---	---	10.1	---	1.4	1.3	---	22.1	2.4	---	4.6
Mauritius	1948-50	---	---	---	---	---	---	---	97.9	---	---	---	0.9	0.6	---	0.6
	1963-65	---	---	---	---	---	---	---	96.1	---	---	---	2.9	0.7	---	0.3
Morocco	1948-50	9.3	32.8	0.1	34.9	7.7	1.9	---	---	3.6	9.6	---	---	---	0.1	---
	1963-65	5.2	33.5	1.3	19.7	9.0	5.7	---	---	0.7	23.8	---	---	---	1.1	---
Senegal	1948-50	1.0	---	5.0	26.2	2.3	1.4	---	---	64.0	0.1	---	---	---	---	---
	1963-65	1.1	---	6.4	23.1	0.7	1.1	---	---	67.4	0.2	---	---	---	---	---
Syria	1948-50	2.1	36.4	2.2	13.3	4.5	1.7	0	---	1.8	18.8	10.3	---	2.6	6.3	---
	1963-65	0.2	21.2	0	11.7	3.0	1.3	1.7	---	10.8	14.5	5.9	---	2.4	27.3	---
Ceylon	1948-50	0.1	---	16.3	0.3	---	1.0	2.0	---	0.2	---	20.3	36.9	0.5	---	22.4
	1963-65	0.1	---	20.7	0.3	---	1.1	2.0	---	0.3	---	20.1	37.0	0.5	---	17.9

1/ Includes cloves, clove oil, and sisal for Malagasy; unspecified fiber for Mauritius; and rubber, spices, and meat for Ceylon.

Table 7.--Absolute change in percentage composition of aggregate crop production 1/

Country	Maize	Wheat	Rice	Other grains	Pulses	Potatoes and yams	Other root crops	Sugar-cane and beets	Annual oil crops	Vegetables and fruits	Olives, palms, coconuts, and copra	Coffee, tea, and cocoa	Tobacco	Cotton	Other crops 2/
	Percentage points														
Bolivia	0.9	-1.2	0.7	1.0	-0.3	-6.6	-0.8	5.9	---	---	---	0.4	---	---	--
Dominican Republic	-1.4	---	4.7	---	-2.8	-1.8	-1.6	3.7	2.8	-3.3	---	1.6	-1.9	---	---
Ecuador	-3.4	-0.8	-2.0	-3.2	-1.2	-0.9	---	1.1	0.2	12.9	---	-2.4	-0.3	---	---
Guatemala	-9.8	0.1	-0.2	0.0	-0.5	0.0	---	3.0	3.3	-6.7	---	-8.5	-0.4	19.7	---
Guyana	---	---	12.7	---	---	---	---	-11.6	---	1.6	-3.1	0.4	---	---	---
Honduras	0.2	---	-0.4	-2.0	1.4	---	-0.1	-1.2	---	-5.7	---	4.5	-2.1	5.4	---
Jamaica	-2.8	---	-0.4	---	0.4	4.5	-4.0	3.4	---	0.9	---	-3.4	1.4	---	---
Nicaragua	-12.0	---	-2.7	-4.2	-2.5	---	---	-3.1	2.5	---	---	-21.0	1.2	41.8	---
Paraguay	-3.2	0.7	0.6	---	1.1	-0.9	-9.7	2.3	5.8	---	---	4.0	1.7	-2.4	---
Peru	-0.6	-1.0	1.9	-1.7	0.0	-10.5	-1.2	2.7	0.5	---	---	7.2	-0.1	2.8	---
Uruguay	-1.8	-8.5	1.8	1.2	---	10.0	---	8.0	-10.7	---	---	---	---	---	---
Malagasy	-0.6	---	1.6	---	---	---	-3.1	---	0.9	0.4	---	-0.3	0.6	---	0.5
Mauritius	---	---	---	---	---	---	---	-1.8	---	---	---	2.0	0.1	---	-0.3
Morocco	-4.1	0.7	1.2	-15.2	1.3	3.8	---	---	-2.9	14.2	---	---	---	1.0	---
Senegal	0.1	---	1.4	-3.1	-1.6	-0.3	---	---	3.4	0.1	---	---	---	---	---
Syria	-1.9	-15.2	-2.2	-1.6	-1.5	-0.4	1.7	---	9.0	-4.3	-4.4	---	-0.2	21.0	---
Ceylon	0.0	---	4.4	0.0	---	0.1	0.0	---	0.1	---	-0.2	0.1	0.0	---	-4.5

1/ Derived from table 6.
2/ Includes cloves, clove oil, and sisal for Malagasy; unspecified fiber for Mauritius; and rubber, spices, and meat for Ceylon.

Countries with changes of 5 to 10 percentage points.--In three countries (Bolivia, Honduras, and Paraguay), changes in the relative importance of individual crops ranged from 5 to 10 percentage points. In Bolivia, two crops--corn and potatoes--accounted for nearly 70 percent of total crop output. Potatoes dropped 6.6 percentage points from 1954 to 1965. Most of this decrease was the result of a rapid rise in the importance of sugar. In the 1954-56 period, sugar represented only 0.7 percent of total output, but rose to 6.6 percent in 1963-65.

In Honduras, maize, bananas, and coffee accounted for nearly 70 percent of total crop output in 1963-65. Bananas suffered the major decline in crop importance, dropping 5.7 percentage points; sorghum, sugar, and tobacco also declined in relative importance. The major increase was in cotton production, which increased 5.4 percentage points from .3 percent in 1948-50 to 5.7 percent in 1963-65. Coffee also increased from 16.0 to 20.5 percent of total crop output.

In Paraguay, cassava accounted for 53 percent of crop output in the 1948-50 period, but its relative importance dropped to 44.2 percent in 1963-65. On the other hand, oilseed crops and coffee increased in importance by almost 10 percentage points.

Countries with changes of 10 to 20 percentage points.--Six countries (Ecuador, Guatemala, Guyana, Peru, Uruguay, and Morocco) had changes in crop output of 10 to 20 percentage points for one or more crops. In Ecuador, coffee and bananas accounted for approximately 55 percent of total crop output in 1950-52. There was a shift toward more specialization, with bananas increasing 12.9 points in importance from 30.7 percent to 43.6 percent of total crop output. All other crop categories, with the exception of oilseeds and sugar, decreased in importance. In Guatemala, on the other hand, there was a decrease in crop specialization. In the early period, wheat and coffee made up nearly 70 percent of the total value of crop output, but by 1963-65, they accounted for only 58 percent. Cotton showed a spectacular gain of 19.7 percent, increasing from .6 percent to 20.3 percent. Sugar and oil crops also gained in importance. Guyana had a high level of crop specialization in both periods, with rice and sugar claiming better than 90 percent of crop output. Rice increased 12.7 percentage points, and sugar declined 11.6 points.

In Peru and Uruguay, there was little overall change in the level of specialization. In Peru, the decrease in the relative importance of potatoes was offset by an increase in coffee. In Uruguay, wheat and sunflowerseed dropped 8.5 and 10.7 percentage points, respectively, while potatoes increased 10 points and sugarcane, 8.0.

Barley declined 15.2 percentage points in Morocco, and fruits and vegetables increased 14.2 points. Citrus fruit was responsible for approximately 8 of the 14.2 points' increase.

Countries with percentage point changes exceeding 20 percent.--Nicaragua and Syria experienced large shifts in the place of individual crops in total crop output mix. In Nicaragua, cotton rose 41 percentage points from the beginning to the ending period--to 48 percent of total crop output. Cotton also gained in relative importance in Syria, increasing from 6.3 percent in 1948-50 to 27.3 percent in 1963-65. In both countries, all grains decreased in

relative importance, declining 19 percentage points in Nicaragua and 20.9 points in Syria. Coffee also experienced a sharp decline in Nicaragua, dropping from 40.5 percent to 19.5 percent, or 21.0 points.

Changes in Relative Importance of Crops

The percentage point shift in the relative place of individual crops in total crop output varied between the beginning and ending study periods (table 7). For example, maize declined in 11 countries, increased in three, and remained unchanged in one country. Rice, on the other hand, increased in 10 countries and declined in six. Sugar gained in eight countries and declined in four. Ten of the 12 countries producing oilseeds showed an increase. Cotton increased in relative importance in six of the seven countries growing cotton and accounted for the largest absolute change in percentage points in three of these countries--Guatemala (19.7), Nicaragua (41.8), and Syria (21.0).

There was no apparent tendency for countries with relatively high growth rates in crop output to become more or less diversified in crop production.

LIVESTOCK OUTPUT IN 12 NATIONS

Data on livestock production were compiled for 12 of the 26 developing nations for which data on crop output only were evaluated in the earlier USDA study. (See footnote 2.)

Production Trends

In 11 of the 12 study countries, livestock output increased rapidly from 1948 to the mid-1950's. In several countries, including Greece, Poland, Japan, and Taiwan, livestock herds were sharply reduced during World War II. However, because farmers in these countries were accustomed to producing cattle, hogs, or other livestock, herds were built up rapidly through natural increase and by importing breeding stock. Feed production was restored, or if necessary, feed was imported.

Livestock output has increased less rapidly since the mid-1950's, when recovery of production from wartime reductions was achieved. Several countries have experienced wide year-to-year fluctuations in livestock output. These may stem from sharp variations in the production of feed or numbers slaughtered because of market requirements.

Percentage variations in livestock output during 1948-65 were smaller in Argentina, Chile, and Colombia than in the other nine study countries. The index of livestock production for Argentina increased only from 90 to 118, and for Chile from 77 to 109. On the other hand, the index nearly doubled for Brazil, tripled for Greece and Taiwan, and rose even higher for Israel and Japan (appendix table 3).

Rates of Growth

Output of livestock products increased at least 4 percent a year in 7 of the 12 countries for the entire period, 1948-65. The rate of increase was from 2.0 to 3.9 percent a year in three countries, and under 2.0 percent in two countries (table 8).

Division of the entire period into the subperiods, 1948-1956 and 1956-1965 shows that growth was more rapid in the earlier than the later subperiod in the nine countries for which data are available. Apparently, these countries were able to proceed rapidly toward achieving prewar levels of livestock production.

Because of population increases, the rate of growth of livestock production per capita was less favorable than the gross rate of change. After 1956, per capita production actually decreased in eight of the 12 countries, and in only three countries did the per capita rate of growth exceed 2.0 percent a year.

The case of Japan deserves separate comment. Japan experienced rapid recovery and continuous development in its livestock industry from 1948 to 1965 with a rate of growth of 13.1 percent. Some analysts no longer include Japan in the ranks of developing nations, but among the "developed." Large numbers of Japanese have attained the income levels required to make substantial purchases of animal and poultry products. Since Japan is heavily populated, it is not economical, and perhaps unfeasible, to produce sufficient animal feed to satisfy Japan's total needs. Therefore, Japan has become a major importer of feed grains and has maintained steady growth of livestock production with the assistance of imported feed. 8/

Livestock growth in the four Latin American countries studied has been low, with the rate of growth declining from the earlier to the later subperiod. For the period 1956-65, livestock production decreased on a per capita basis in Argentina, Chile, and Colombia. There was no significant change during this period in Brazil.

Failure of livestock production to increase rapidly does not necessarily indicate lack of economic success. It may be sound for some countries to emphasize development of crop production, especially attempts to develop specific crops with higher protein content, since feed grown for livestock production may be in direct competition with crops needed to meet human consumption requirements.

Growth of livestock output is in some respects an inherently slower process and more difficult to achieve than growth in crop production. The biological cycle is relatively long for most species, especially cattle, so it takes several years to observe the results of change. Also, livestock production may be even more closely tied to traditional ideas and patterns of living than is crop production. In some societies, the number of cattle a person owns, not

8/ Mackie, A.B., Filippello, A.N., Hutchison, J.E. and Keefer, J.F. World Trade in Selected Agricultural Commodities, 1951-65. Vol. II, Food and Feed Grains: Wheat, Rice, Maize, Barley, and Other Cereals. U.S. Dept. Agr., Foreign Agr. Econ. Rpt. No. 45, July 1968.

Table 8.--Annual compound rates of change in livestock output, selected countries, 1948-65, 1948-56, and 1956-65 1/

Country and region	1948-65			1948-56		1956-65	
	Annual compound change in total livestock output	Population growth rate	Annual compound change in livestock output per capita	Annual compound change in livestock output		Annual compound change in livestock output	
				Total	Per capita	Total	Per capita
	Percent						
Latin America							
Argentina	0.7	1.8	-1.2	3.1	1.0	-0.6	-2.4
Brazil	4.1	3.0	1.0	4.9	2.0	2.7	2/
Chile	2.1	2.4	-0.4	3.2	0.7	1.1	-1.3
Colombia	0.6	2.2	-1.8	3/	3/	0.8	-1.4
Europe							
Greece	6.7	0.9	5.8	9.3	8.1	5.1	4.3
Poland	4.8	1.7	3.3	6.4	4.4	3.0	1.6
Spain	5.2	0.8	4.3	3/	3/	5.9	5.0
Near East and South Asia							
Israel	8.7	4.8	3.8	15.0	7.2	2.8	-0.9
Turkey	2.5	2.8	-0.3	3.6	0.9	0.6	-2.2
United Arab Republic	2.2	2.5	3/	3/	3/	1.2	-1.3
Far East							
Japan	13.1	1.2	11.8	17.8	16.2	12.6	11.6
Taiwan	6.8	3.6	3.1	11.6	7.4	2.4	-1.0

1/ Actual years of data used indicated in appendix table 3. Sources of population statistics cited in table 1.

2/ Statistically significant at greater than 5 percent level. All other growth rates significant at less than 5 percent level.

3/ Data not available for sufficient years to compute growth.

the number he sells, is a major criterion of prestige. 9/ It is understandably difficult to secure the adoption of improved management practices where ownership of livestock is a status symbol, where the biological cycle is long and it is difficult to collect data to show the value of adopting improved practices, and where the marketing system is inadequate.

TOTAL AGRICULTURAL OUTPUT IN 12 NATIONS

Total crop output plus livestock production is an indication of total production, but not of production available for consumption purposes since double counting is involved. Therefore, that portion of crops fed to livestock and used for seeds must be subtracted to arrive at a realistic measure of a nation's agricultural output available for consumption purposes.

In computing total agricultural output, livestock data are taken for the 12 countries presented in the previous section. The value of crop production in these countries is from Foreign Agricultural Economic Report No. 27, updated to 1965. (See footnote 2.) Details on crop production in these countries can be found in the earlier study.

In most of the 12 study nations, total agricultural output increased more rapidly in the 1948-56 subperiod than from 1956 to 1965. The rate of increase was 2.0 percentage points a year lower in several countries in the later subperiod than it was in the earlier time period.

For the overall time period 1948-65, rates of growth of total agricultural output exceeded 4 percent per year in four countries: Brazil, Greece, Israel, and Taiwan. Agricultural output increased from 2.0 to 3.9 percent per year in seven countries, and was less than 2.0 percent in only one of the 12 countries, Argentina (table 9).

When total agricultural output is converted to a per capita basis, it becomes apparent that much of the total increase was absorbed by population growth. But the principal fact to note is that there was a larger volume of livestock and crops--food, beverage, fiber, and industrial--per capita in 1965 than in 1948. The annual increase per capita was 2 percent or more in Greece, Spain, Israel, and Japan; 1.0 to 1.9 percent in Brazil and Poland; and zero to 0.9 percent in five countries. Argentina showed the only decrease.

While there was a moderate increase in per capita output in the 12 countries, the increases are not impressive from either a nutritional or economic viewpoint, since production was insufficient to allow large increases in per capita levels of total output.

9/ Herskovits, Melville J. The Human Factor in Changing Africa. Alfred A. Knopf, New York, 1962, pp. 65-66.

Table 9.--Annual compound rates of changes in total crop and livestock output, 12 countries, 1948-65, 1948-56, and 1956-65 1/

Country and region	1948-65			1948-56		1956-65	
	Annual compound change in total output	Population growth rate	Annual compound change in total output per capita	Annual compound change in crop and livestock output		Annual compound change in crop and livestock output	
				Total	Per capita	Total	Per capita
	Percent						
Latin America							
Argentina	1.6	1.8	2/-0.3	3.1	2/0.9	2/0.7	2/-1.0
Brazil	4.1	3.0	1.1	3.6	2/0.8	4.0	2/1.0
Chile	2.7	2.4	0.2	4.1	1.7	2.0	-0.4
Colombia	2.5	2.2	0.3	3/	3/	3.0	0.8
Europe							
Greece	4.6	0.9	3.7	6.0	5.0	3.5	22.7
Poland	3.3	1.7	1.6	2.9	1.0	2.7	1.3
Spain	2.9	0.8	2.0	3/	3/	3.1	2.2
Near East and South Asia							
Israel	10.5	4.8	5.6	14.6	7.2	7.3	3.4
Turkey	3.6	2.8	2/0.7	5.5	2/2.7	2.2	2/-0.6
United Arab Republic	3.2	2.5	0.8	3/	3/	2.8	2/0.4
Far East							
Japan	3.5	1.2	2.3	3.6	2.0	2.8	1.8
Taiwan	4.6	3.6	0.9	6.4	2.4	2.8	-0.6

1/ Actual years of data used indicated in appendix table 4. Sources of population statistics cited in table 1.

2/ Significant at greater than 5 percent level. All other growth rates significant at less than the 5 percent level.

3/ Data not available for sufficient years to compute growth.

APPENDIX

Appendix table 1.--Indices of total crop output, selected countries, 1948-65 1/
(1957 = 100)

Country and region	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
	Percent																	
Latin America																		
Bolivia	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	72	79	85	94	98	108	103	109	103	119	118	109
Dominican Republic	68	72	74	77	79	83	89	88	92	98	98	104	115	107	108	107	108	102
Ecuador	n.a.	n.a.	50	49	54	57	87	97	102	95	96	109	115	121	120	123	113	124
Guatemala	n.a.	68	71	78	76	80	82	84	90	96	98	106	109	121	143	149	149	170
Guyana	65	55	66	74	83	83	82	86	90	91	102	106	119	126	124	115	120	136
Honduras	81	80	82	83	85	90	81	84	97	97	102	101	98	112	118	118	135	140
Jamaica	60	67	72	69	71	87	94	95	88	94	91	115	124	124	120	126	132	137
Nicaragua	33	60	57	74	77	90	111	104	111	106	107	88	103	128	151	162	206	191
Paraguay	64	74	72	83	81	89	87	86	88	96	101	103	102	108	117	125	119	124
Peru 2/	60	62	67	70	73	79	81	80	74	78	86	89	94	102	103	101	107	101
Uruguay	92	79	75	126	97	125	129	127	118	113	116	71	88	112	108	105	113	109
Africa																		
Malagasy Republic	68	69	79	75	88	92	89	98	93	104	101	94	109	107	113	115	122	117
Mauritius	70	74	81	87	84	92	89	95	102	101	95	104	44	100	97	124	95	121
Morocco	77	76	69	86	80	109	117	96	103	69	122	109	113	72	120	126	130	133
Senegal 3/	69	68	64	66	67	76	61	72	83	98	85	91	100	109	103	111	114	130
Near East and South Asia																		
Syria	70	85	77	70	93	102	109	82	115	118	94	88	89	108	163	145	174	170
Far East																		
Ceylon	74	76	81	85	89	87	94	101	98	96	101	102	110	117	122	124	130	120

1/ Crop output includes food and beverage crops, fibers, tobacco, and industrial crops; in a few cases, data are for field crops only since information on tree crops is unavailable.
2/ 1960-62 = 100.
3/ 1959-61 = 100.
n.a. = not available.

Source: Foreign Regional Analysis Division, Economic Research Service, USDA.

Appendix table 2.--Indices of crop output per hectare harvested, selected countries, 1948-65 1/
(1957-59 = 100)

Country and region	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
	Percent																	
Latin America																		
Ecuador	n.a.	n.a.	88	84	89	91	101	101	98	93	101	106	106	117	109	106	109	109
Guatemala 2/	n.a.	72	82	99	104	91	110	100	96	98	103	99	110	125	147	153	161	178
Honduras	105	101	102	101	101	102	104	102	100	103	100	97	98	102	103	103	94	82
Nicaragua	60	72	70	93	97	110	113	89	94	103	108	88	100	125	136	158	181	150
Peru 3/	85	86	85	87	87	92	95	93	88	90	98	94	96	102	103	98	103	95
Uruguay	112	99	101	126	104	124	130	122	115	98	107	92	99	135	135	142	147	160
Africa																		
Malagasy Republic	93	96	100	89	102	102	99	105	101	101	99	99	108	104	105	106	113	107
Mauritius	92	91	95	97	90	99	94	101	107	105	95	101	42	94	88	113	86	109
Morocco	83	92	99	97	105	104	109	106	96	84	110	106	104	94	92	108	100	100
Senegal	82	80	74	80	80	88	70	84	97	103	91	96	101	103	96	96	101	103
Near East and South Asia																		
Syria	129	139	117	103	124	128	125	87	116	115	93	92	91	116	166	156	171	168
Far East																		
Ceylon	82	84	87	92	96	92	94	96	98	98	99	102	105	114	117	114	120	117

1/ Tree crops excluded for Latin America and Senegal.
2/ Excludes grain sorghum and sugarcane.
3/ 1960-62 = 100.
n.a. = not available.

Source: Foreign Regional Analysis Division, Economic Research Service, USDA.

Appendix table 3.--Indices of total livestock output, selected countries, 1948-65
(1957-59 = 100)

Country and region	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
	Percent																	
Latin America																		
Argentina	94	90	93	91	90	96	105	111	118	93	104	102	101	98	98	104	103	n.a.
Brazil	62	64	66	70	73	78	82	84	91	96	102	102	102	107	110	111	114	121
Chile	n.a.	n.a.	n.a.	84	77	84	90	92	93	95	96	109	105	105	98	102	104	n.a.
Colombia	n.a.	n.a.	n.a.	58	1/	1/	80	121	91	114	96	90	93	93	87	98	120	n.a.
Europe																		
Greece	46	51	54	59	59	69	78	91	90	94	101	105	103	107	126	137	134	135
Poland	48	66	69	73	76	78	82	86	90	94	100	107	108	114	109	109	n.a.	n.a.
Spain	n.a.	n.a.	n.a.	n.a.	76	92	81	91	93	97	97	106	114	125	127	147	144	144
Near East and South Asia																		
Israel	21	28	30	31	34	42	50	58	69	89	100	111	126	133	130	142	144	n.a.
Turkey	85	45	77	88	88	82	66	86	98	94	99	108	90	65	101	107	109	n.a.
United Arab Republic	n.a.	n.a.	n.a.	n.a.	74	79	89	89	88	101	96	103	96	99	102	102	104	n.a.
Far East																		
Japan	27	30	28	55	63	62	74	88	85	88	106	106	127	169	173	181	206	n.a.
Taiwan	34	38	47	72	67	76	73	71	87	105	104	91	94	105	106	104	120	n.a.

1/ Less than 0.5 percent.
n.a. = not available.

Source: Foreign Regional Analysis Division, Economic Research Service, USDA.

Appendix table 4.--Indices of total crop and livestock output, selected countries, 1948-65
(1957-59 = 100)

Country and region	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
	Percent																	
Latin America																		
Argentina	90	84	85	79	90	93	100	98	112	90	107	103	97	102	101	110	111	n.a.
Brazil	66	69	72	70	75	78	81	88	86	94	96	110	104	114	115	119	109	138
Chile	n.a.	n.a.	n.a.	80	78	84	89	93	94	92	105	103	105	105	100	109	113	n.a.
Colombia	n.a.	n.a.	n.a.	73	43	60	89	99	87	96	101	103	107	104	109	109	119	n.a.
Europe																		
Greece	52	72	58	70	64	83	80	86	89	103	96	101	92	109	103	n.a.	n.a.	n.a.
Poland	68	78	83	75	78	80	86	85	94	95	103	102	109	115	108	112	n.a.	n.a.
Spain	n.a.	n.a.	n.a.	n.a.	88	84	90	87	90	96	97	107	103	109	112	126	112	119
Near East and South Asia																		
Israel	27	32	37	40	48	64	67	69	81	90	102	107	107	116	127	133	152	n.a.
Turkey	70	54	70	84	84	95	78	85	95	93	101	106	102	96	111	119	120	n.a.
United Arab Republic	n.a.	n.a.	n.a.	n.a.	82	76	90	88	90	98	99	103	108	98	113	114	116	n.a.
Far East																		
Japan	72	71	75	76	83	72	79	100	93	96	100	104	109	111	114	112	116	n.a.
Taiwan	51	60	67	72	75	83	83	81	90	98	102	100	101	109	109	106	121	n.a.

n.a. = not available.

Source: Computed from crop and livestock production data compiled by Foreign Regional Analysis Division, Economic Research Service, USDA.